

Risky Business: Choosing the Right Project Delivery System

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Introduction

Where should the owner draw the line when allocating project risk? From an owner's perspective the most desirable outcome for any construction project is a quality project completed on time, within budget and with no possibility of claims. Conversely, the contractor is in business to make money. While these goals need not be divergent, the path to achieving them often results in negative consequences for either one or both parties.

Every owner must give careful consideration to the potential litigation that can arise from cost overruns, a delayed start-up or contractual difficulty. Selecting a project delivery system that distributes risk equitably (in other words, to the entity best suited to control the risk) can lead to decreased owner control, however, appropriate delegation of responsibility among the involved parties can give the owner a level of control that is effective. The selection of a project delivery system should take into account the owner's needs, project variables and the optimal combination of asset and resource allocation to optimize use of the owner's in-house capabilities while optimizing the opportunity for both the owner and contractor to reach their objectives.

There are numerous risks involved in the construction of any project including: design and construction quality, cost and schedule control, contractor and subcontractor capabilities, unforeseen conditions, weather, site safety and security, scope complexity, technology issues, funding and financing. The allocation of risk, as determined by the selected project delivery system and associated contract language, can have a multiplier effect on the efficiencies of construction and project completion. Before the owner implements a risk strategy, they must understand the delivery systems, available options and the professional and contractual relationships among project participants in addition to the unique technical requirements of the project.

As projects differ greatly in complexity, the involvement and coordination of project activities and participants – the owner, architect/engineers, construction managers, contractors, consultants and outside agencies – also differ. Of prime importance to the owner is the ability to mediate and direct the interaction and task allocation of these project participants, dictated largely through contractual obligations, to minimize project risk and maximize project efficiency.

The *right* project delivery system for a particular owner depends on the level of responsibility and risk that suits the needs of the project, the culture of the owner and is properly communicated and expressed in the contract.

Project Delivery Systems

Although there are many definitions and several variations of project delivery systems, the four principal systems discussed in this paper, are the Traditional, General Contractor as Construction Manager (GCCM), Design-Build and Turnkey Project Delivery Systems. Each delivery system spans the entire process involved in project implementation, from conceptual planning through design, construction and start of operation

The ***Traditional Project Delivery System*** is most commonly used for major public works projects and any owner who would desire the certainty of design and pricing as is allowed by this method. All project elements are designed to 100 percent completion by the owner or the owner's consultants. Individual contract packages are put out for bid and awarded to the lowest responsive and responsible

bidder. The owner retains responsibility for overall project management, organizes the work of the individual contractors selected for each contract package and manages the interface coordination. This approach is based on the linear sequence of design, bid & award and construction phases, and the delegation of responsibility for each phase. The main concepts associated with a traditional project delivery system include:

1. All contracts are executed directly with the owner;
2. Construction and procurement documents are comprehensive and complete;
3. The contractor selected for construction does not participate in the design phase;
4. The owner makes an investment in the design and other activities before a total project price is established;
5. The design and construction management professionals function as the owner's agent;
6. The owner bears major project risks until construction contracts are signed, at which time a large portion of the risks are transferred to the contractor assuming that the contract documents are complete and correct; and
7. Multiple contract packaging is frequently used.

The ***General Contractor as Construction Manager (GCCM) Project Delivery System*** differs in that the owner hires a general contractor to perform the coordination of construction events. The general contractor begins its engagement as a construction manager and works with the owner and design consultant to effect the contract documents. In this manner the owner receives the benefit of on-going constructability, bid packaging, and other expertise that should result in a buildable, cost effective package. The general contractor then changes roles and might perform a portion of the construction work or, they may act as a broker and subcontract the construction work entirely. The general contractor lets the various construction subcontracts and is responsible for their performance. The owner may procure a separate construction manager to verify quality, facilitate owner/contractor/design consultant interaction, review the contractor's scheduling and represent the owner's overall interests on the project. Noteworthy elements of the GCCM project delivery system include:

1. The owner delegates construction realization responsibility by contracting with a general contractor/construction manager;
2. The general contractor/construction manager contracts with subcontractors to undertake all or some of the construction packages. Subcontract letting requires owner approval;
3. Coordination of trades is performed by the general contractor;
4. The competitive bid process is used for all contracting;
5. The owner can hire a design consultant and a professional construction manager to ensure that project aims, from the owner's perspective, are being met;
6. Although the owner or owner's consultants perform the design through 100 percent completion, plans and specifications need not be complete prior to the general contractor commencement of fieldwork;
7. Project financing and general contractor payment is arranged for and administered by the owner;
8. Substantial risk is transferred from the owner to the general contractor/construction manager, similar to that of a general contractor in the traditional method; and
9. Early involvement of GCCM in the project to effect quality of design.

The ***Design-Build Project Delivery System*** varies significantly from the traditional project delivery system. The implementation shifts from an owner-managed-and-controlled final design to the management of one or a group of design-build contracts. Variations to this delivery method include Design-Build Operate/Maintain (DBOM) and Design-Build/Finance/Operate/Maintain (DBFOM). Project elements are developed through preliminary engineering to approximately the 30 percent design level before being issued for bid as design-build packages. Design-build contracts are usually based on a fixed price or GMP with an agreed upon schedule for completion. Equipment and/or systems elements may be awarded to contractors who design, furnish and install the equipment based on performance specifications, or proprietary equipment and/or systems may be specified. The owner may be required to coordinate the work of the individual design-build contractors and manage the interface coordination. The design-build project delivery system's key points include:

1. Design is developed by the owner through preliminary engineering to approximately the 30 percent level prior to bid;
2. The contractors complete the final design and build the project elements. The contractors must add contingencies (larger than in the traditional project delivery system) to cover unknown additional costs;
3. Flexibility and opportunity for contractor innovation;
4. Drawings, plans and specifications may remain the property of the contractor;
5. There is reduced owner control of design elements than with the traditional project delivery system;
6. Multiple contract packages can be involved;
7. Design-build contracts often include incentives; and
8. While risk for the performance of construction is shifted to the contractor, the owner still shoulders responsibility for the risk associated with the performance of the constructed facility.

The Turnkey ***Project Delivery System*** involves one contract, which is a comprehensive design-build contract with a single contractor. As such it places all of the responsibility for project elements on the turnkey contractor. A full turnkey project delivery system calls for selection of the turnkey contractor prior to establishing the relationships and responsibilities between the owner and the turnkey contractor. The turnkey contractor is responsible for the final design of the project following preliminary engineering, up to 30 percent design completion (depending upon the owner's preference), by the owner or the owner's consultants. The turnkey contractor completes the project on the owner's site for a fixed price and according to an agreed upon schedule. The key elements of the turnkey delivery system approach include:

1. The owner holds only one turnkey contract for final design and construction;
2. The turnkey documents prepared by the owner must be adequate and specific about the basis for award, since turnkey proposals can differ significantly in scope;
3. The turnkey contractor is responsible for completing the design;
4. Bidders must perform a significant amount of design and cost estimating work to determine their bid price. The contractor must add a contingency (larger than in the traditional project delivery system) to cover unknown additional costs;
5. The turnkey contractor has increased opportunity to shorten the project schedule by overlapping the design, procurement and construction phases. However, it is the contractor who assumes most of the risk for proceeding on a "fast track" basis;
6. The risk to the contractor is significantly greater, and conversely lesser to the owner, than the traditional project delivery system because the turnkey contract is let before the design is complete, the project clearly defined and all site conditions are known; and
7. Flexibility and opportunity for contractor innovation.

When the turnkey contractor also participates in the funding of the project, the project delivery system is known as a ***Super Turnkey Project Delivery System***. Funding arrangements may include the entire project or, alternatively, a significant portion of the project with the owner supplying the balance of the funds. Financing by the contractor may take the form of loans or lease/buy backs.

There can be a combination of approaches that are used for construction programs. One example is a combination of the traditional project delivery system and a design-build project delivery system.

Light rail transit owners often choose to utilize the conventional project delivery system. In such a case, the traditional project delivery system is employed for *facility elements* (roadbed or guideway, foundations, bridges, tunnels, sitework, stations, parking lots, and yard and shop facilities) using in-house staff or design consultants to carry the design through 100 percent completion, and the design-build project delivery system (using an EPC – "Engineer, Procure and Install" contract) for proprietary *systems elements* (vehicles, trackwork, electrification systems, signals, communication systems and fare collection equipment). For the design-build phase, vendors often specialize in a particular systems element.

Vendors typically receive performance and design criteria for the element and guarantee that standard requirements will be met for a fixed price.

Advantages and Disadvantages

The project delivery system selected determines the responsibility allocation between the owner, contractor, designer and construction manager. The turnkey project delivery system frees the owner from substantial project risk, but leaves him with comparatively little control of project input. The traditional project delivery system is just the opposite.

So how does the owner decide which system to use? This decision should be based on the type of project to be implemented and the corresponding risk/responsibility mix that the owner desires. Further complicating the decision is the adversarial environment that develops through the illogical or inconsistent transfer of risk from the owner to the contractor and consultants. The risk matrix must include an identification of which party can best assume a given risk when determining the optimum delivery method. Any of the alternative project delivery systems can be successfully used given appropriate project characteristics suited to a given delivery system along with careful planning, proper contract specification development and the necessary level of management and owner control. However, weighing the advantages and disadvantages of each of the project delivery systems permits the project owner to custom fit the project delivery system to their needs. The following advantages and disadvantages are outlined for convenient comparison purposes.

The ***Traditional Project Delivery System*** provides maximum owner control over the project elements to the lowest contract level. Due to the nature of the traditional project delivery system, there are increased opportunities as the design progresses under the owner's strict guidance to receive input from other affected parties.

Advantages of the Traditional Project Delivery System include:

Control

1. Project delivery system allows maximum owner control over project variables.
2. The traditional project delivery system allows the owner to promote greater distribution of work to local consultants, contractors and vendors through increased number of contracts.
3. Design and construction management professionals function as the owner's agents, promoting the owner's interests and goals.

Quality

4. The owner can define and detail their needs and requirements to absolute specification.
5. The owner-managed delivery system process allows time for the owner, consultant engineers, board, community governmental agencies and funding agencies to coordinate throughout the design process to ensure the owner is buying a product acceptable to all parties.

Budget/Schedule

6. There is potential for increased savings to the owner through increased contractor competition and through well-conceived and consistent bid documents. This will result in tight bid spreads.
7. The owner has greater control over interface milestones and other critical interfaces.
8. Project delivery system allows the greatest funding flexibility -- design and construction contracts can be let according to owner cash flow.

Disadvantages of the Traditional Project Delivery System include:

Control

1. The owner has a greater management role and needs a larger staff to maintain proper project control.
2. Multiple interfaces between the owner, design consultant, construction manager, and contractor(s) can result in the owner acting as a referee.

Quality

3. Potential for design change exists up to the contract letting.

4. To the extent not covered by Errors and Omissions coverages, the owner is responsible for approving the design and living with a poor design.
Budget/Schedule
5. The owner is ultimately responsible for the project schedule. Management of the interfaces are usually the greatest area for delays and changes.
Risk
6. Unforeseeable and uncontrollable risks are the owner's responsibility.

The allocation of risk in the traditional project delivery system leaves a significant amount of liability for project completion with the owner. The multiple contract/multiple contractor arrangement disperses concentrated responsibility for major portions of the project thereby increasing owner coordination responsibilities and risks. Furthermore, this project delivery system makes coordination of the many parties a potentially cumbersome task. One contractor with a minor construction role could hold up the critical path and prevent scheduled completion for other parties. The owner using the traditional project delivery system is responsible for overall project management and is necessarily the "risk manager" for the project's scheduled completion and final cost. The contractors are de facto responsible for fulfillment of their contracts and the amount of risk corresponding to their particular task.

However, owners typically can and often do recruit the skill and expertise of a construction manager who will represent the owner's interests. This can provide the owner with professional managerial services to supplement in-house capabilities. Furthermore, the project owner may feel that in contracting a construction manager's services they have a partner for project responsibility and risk. The construction manager's liabilities are determined by the tasks that the construction manager chooses to undertake. If the owner, for example, uses the construction manager in the capacity of a design consultant to perform value engineering, then the construction manager is obligated to execute the analysis using the same standards a design consultant would use. Essentially, the construction manager becomes more liable as the owner delegates more responsibility to the construction manager.

The advantages and disadvantages encountered in a **GCCM Project Delivery System** include elements of the advantages and disadvantages from both the traditional and the design-build project delivery systems. This is so because of the GCCM contractual nature. The owner retains an important degree of project involvement, yet allows the general contractor/construction manager a large scope of autonomy and responsibility for project completion. It is inherently the contractor who must answer to the owner for subcontractor and design modification approval, but the owner, typically, has only the right to veto contractor propositions. The owner often hires a professional construction manager to ensure general contractor attention to owner prerogatives and overall project quality.

Advantages of the GCCM Project Delivery System include:

- Control*
1. Project delivery system allows flexibility during construction, as owner retains right to modify plans and approve subcontracting packages.
2. The lines of responsibility are kept simple with one party responsible for construction.
3. Project delivery system allows for a high degree of control over specialized work, even if the owner has insufficient in-house resources or expertise to manage the contracts.
- Quality*
4. Advice from the general contractor during the design stage leads to early "buildability" input.
- Budget/Schedule*
5. Overlap of design and construction can lead to early start of construction and early project completion.
6. The involvement of management contractor at the planning stage allows packaging contracts to be compatible with contractors' strategies.
7. There is increased reliability of cost and time estimates since individual packages can be let at the last minute to ensure flexibility and more accurate and complete pricing.

Disadvantages of the GCCM Project Delivery System include:

Budget/Schedule

1. There can be uncertainty about the cost of the complete project at the start of construction if proceeding on a “fast track.”
2. Without contract incentive or GMP limits, the general contractor has no reason to keep costs down. This is especially true if they are working on a percentage fee basis.
3. Added management costs by the owner when hiring a separate construction manager to represent owner interests.
4. On a “fast track” program, the design may suffer if the architect is placed under undue pressure.
5. Multiple contracts can create scheduling difficulties for the general contractor as well as interface related changes from various subcontractors that affect separately held contracts by the owner.
6. If the general contractor falls behind, subcontractors may not be paid and the entire project can systematically grind to a halt.

The **Design-Build Project Delivery System** sacrifices a degree of owner control ranging from modest to significant, but enables suppliers to tailor final design to their specific products rather than having to re-engineer to the owner’s exact specifications. Unless properly specified and managed, this delivery system can have the effect of limiting competition, thus affording an advantage in subsequent projects to those firms successful in the initial stage. Opportunities for locally based, smaller sized firms shrink, limiting the ability of local public agencies to “reach out” to disadvantaged and local businesses.

Advantages of the Design-Build Project Delivery System include:

Budget/Schedule

1. The contractor’s increased control may result in lower overall costs.
2. The potential for early completion on a “fast track” schedule is heightened because construction and manufacturing can begin before the plans and specifications are completed.
3. A single source for design and construction may permit increased communication and faster reaction to project developments.

Risk

4. Responsibility and risk are delegated to a single source for design and construction.
5. The majority of project completion risk and budget conformance is allocated to the contractor.
6. Owners must rely on the contractor to construct a functional facility without the benefit of the level of oversight normally available through other delivery methods.

Disadvantages of the Design-Build Project Delivery System include:

Control

1. Drawing, plans and specifications may remain the property of the contractor unless otherwise established in the contract.

Quality

2. Objectivity among the design-build participants could potentially become obscured. Design professionals hired by the contractor have no obligation to inform the owner about defects and deficiencies in the contractor’s work.
3. Owner’s input on the detailed design is limited because the contractor, rather than the owner is responsible for furnishing the design work. As a result, the completed project may not be exactly as the owner expected.
4. The owner may find it difficult to induce contractors to produce construction drawings for review unless they are compensated for their costs.

Budget/Schedule

5. There is the potential for claims and schedule delays due to differences in interpretation of the preliminary engineering (30 percent design) products.
6. The owner must coordinate interfaces between the design-build contractors.
7. There can be uncertainty over the final project cost if proceeding on a “fast track.”
8. The owner may pay a premium if there are major changes on the project.

The design-build alternate delivery method has grown in acceptance over the last ten years to an established alternative to the construction industry. Owners have used the rationale of design-build to trim their staffing levels of dedicated personnel for a project to a fraction of earlier, historical levels. The frustration that has resulted from construction disputes combined with pressures to reduce in-house staff has driven owners to resort to single-source responsibility for project execution. Owners have assembled integrated teams with separate management consultants who answer directly to the owner management staff.

The role of the construction management consultant has also evolved under design-build. The construction manager's function may include an oversight responsibility as well as the administrator for the owner's responsibilities.

The **Turnkey Project Delivery System** represents one more level of risk shifting from owner to contractor. The turnkey project delivery system focuses responsibility for cost and schedule performance, quality, achievement of performance standards and successful system operation in a single entity. This removes the owner from responsibility for many internal interface-related issues. However, this project delivery system significantly lessens owner control. Also, unless properly specified and managed, this approach can have the effect of limiting competition thus affording an advantage in subsequent projects to those firms successful in the initial stage.

Advantages of the Turnkey Project Delivery System include:

Control

1. The project delivery system makes alternative contracting methods possible.

Budget/Schedule

2. Contractor's increased control may result in lower overall costs.
3. The potential for early completion on a "fast track" schedule, as construction and manufacturing can begin before plans and specifications are completed.
4. Unified project control of design and construction may permit enhanced communication and thus increased efficiency in reacting to project developments.
5. Project delivery system alleviates cost uncertainties for the project owner.

Risk

6. There is a single and absolute point of design and construction responsibility.
7. Significant risk is transferred from owner to contractor.

Disadvantages of the Turnkey Project Delivery system include:

Control

1. Project delivery system allows minimum owner control over design and construction.
2. Drawings, plans and specifications may remain the property of the contractor.
3. Proprietary designs may be incorporated into the system, which could minimize competition on future extensions of the given project.
4. There are reduced opportunities for outreach and third party participation in project realization.

Quality

5. The owner's input on the detailed design is limited because the contractor, rather than the owner is responsible for furnishing the design work. As a result, the completed project may not be exactly as the owner envisioned.
6. The owner may find it difficult to induce contractors to produce construction drawings for review unless they are compensated for their costs.

Budget/Schedule

7. There is the potential for claims and schedule delays due to differences of interpretation of the preliminary engineering, if any, completed by the owner.
8. Potential project savings through unified management in a fixed-price contract may go to the contractor, as opposed to the owner.
9. There can be uncertainty about the complete project cost at the start of construction if proceeding on a "fast track."

Risk

10. There is risk to the owner of failure by the single contractor and consequently a high bond cost to owner.
11. Although the contractor assumes the large majority of risk, third party obligations and risk to other agencies and utilities remain with the owner.

The owner still retains risks inherent to every project delivery system, even with a turnkey fixed-price contract. Variables that the owner must consider “risk factors” for which they could be held liable, include quality assurance, initial programming and scope, changes in scope, complexity of design, completeness of original 30 percent drawings (if completed by the owner), owner’s standards and schedule duration. The owner may desire to use a turnkey project delivery system if they have no requirement to control the “details” of a project.

Risk Allocation

Every project delivery strategy should allocate risk among the involved parties to place the appropriate risk on the group that is best able to handle it. Risk burden can be divided into project component elements and analyzed to give a clearer picture of the risk that our principal project delivery systems allocate to the owner, design consultant and contractor.

The ***Traditional Project Delivery System*** is perhaps the simplest of the delivery systems to evaluate. The owner, who retains overall project management responsibilities, has designed the project to 100 percent completion and consequently delegates task authorization to various subcontractors and subconsultants. As such, the project scope involving initial project inception, conceptual planning, cost management, feasibility studies and site selection, lies within the owner’s design consultant retains responsibility and controllable risk for the quality and integrity of their designs. In the traditional project delivery system the owner retains overall project management responsibilities and overall project risk. This is common practice unless there is risk sharing built into the contract for when and if the construction manager performs special services, which introduce specific risks, such as design document reviews. Each subcontractor is required to perform to the level of contractual obligation, but risk for overall project quality, start-up, site safety, unforeseen conditions, craft control, payment schedules, scope changes and programming continues to be born by the owner. When choosing this delivery method, the owner must determine if it has the correct mix of staff resources and expertise to provide the oversight and reviews necessary to verify that the design is complete, that the specifications are consistent with the drawings and applicable building codes, and that the design is buildable within the project budget. During the construction phase of the work, the owner must be certain that the right supporting elements are in place to review contractor submittals, inspect the work as it is placed, document the work (schedules and logs), deal with agencies and third parties, as well as to facilitate the contractors’ efficient execution of the work. The team organization must be clearly defined so that the contractor deals consistently with the owner and its subconsultants. The owner must be able to respond to inquiries from the field so that the contractor is not delayed.

The ***GCCM Project Delivery System*** delegates risk appropriation between the owner and the contractor in a more distributed fashion. For almost any activity or task within the project the contractor always bears risk, but the owner is never so completely removed from the project as to negate their liability and risk. The scope of risk burden places all significant financial matters into the hands of the owner. Not only must the owner provide the funding for the project but they must also budget the money and control the veritable “purse strings” of the project. Conceptual planning and site selection liabilities are shared by the owner and their design consultant (Again, the design consultant is solely responsible for the adequacy of the feasibility studies). Once construction begins, the owner relinquishes some risk to the contractor who takes charge of construction, quality control, site safety, cost risk and craft control. It is important to note that under the GCCM project delivery system the owner never vacates the on-going construction process, but may engage a separate construction manager to represent their interests with the general contractor and ensure conformance with their design.

The ***Design-Build Project Delivery System*** significantly deviates from the traditional project delivery system of owner-centered risk burden. Because of the nature of the design-build project delivery system, the owner transfers a great deal of responsibility for both the design and construction to the contractors. In so doing, the owner removes their capacity to control the project as comprehensively as in the traditional project delivery system, but they also shift the majority of risk to the contractor. The owner's design consultant retains risk for the quality and performance of the 30% preliminary design required by the general contractor.

The owner's main risk area is concentrated around issues involving funding, payment schedules, scope changes, complexity of design requirements, owner's safety standards, adequacy of schedule duration, site selection and interface management between the multiple contractors. The design-build contractor assumes accountability for the detailed design and the construction phases. Budgeting, programming and the remaining 70 percent design dominate the design-build contractor's second phase risks. During the construction phase, they must share the risks that the owner would assume in a traditional project delivery system. These include, quality control, site safety, cost risk, unforeseen conditions, craft control/relations and start up.

For the ***Turnkey Project Delivery System***, the "contractor" is responsible for the entire project and therefore assumes most of the primary risk. The owner, although separated from the project, has an increased risk factor with respect to the contractor's performance and delivery of the completed project, and needs a higher level of protection (higher bonding and insurance costs). Risk allocation in a turnkey project highlights the owner's disassociation from the project. After the initial 30 percent engineering, the owner all but leaves the scene while the contractor assumes comprehensive control for every aspect except funding and financing. The owner can, usually at great expense, introduce scope changes in which case they must accept the corresponding project liability as implicated by the changes.

So then, how does an owner decide upon a project delivery method? Using risk as a focal point, the authors have attempted to define the most commonly accepted delivery methods, identify which party assumes the "heavy-half" of the various risk factors for each, and then to describe the overall advantages and disadvantages associated with a given option. With this paper as a tool in hand, the next step in the process should be to develop a weighted matrix that assesses at a minimum the following aspects:

1. Internal Staffing

- Number and experience of staff resources
- Long-term budget (Can you retain your staff for future work?)
- Staff experience with the delivery method under consideration

2. Nature of the Program

- Length of the program (Can it support staff for a long term?)
- What is the primary consideration?
 - Cost
 - Schedule
 - Aesthetics
- Is the first phase of a multi-phase program?
 - Develop Standards for future phases
 - Success of the first phase could determine funding for future phases
 - "Rules" associated with funding

3. Technology

- Use of industry standards versus new technologies
- Impact of technology changes to the design/construction
- Number of contractors who have built similar programs
 - Need for control from planning through design

4. Political Issues

- Political backing for the program (Is there a “Champion?”)
- Public perceptions of the Organization
 - Bloated?
 - Dysfunctional?
 - Recognized as a National Leader?
- Competition for available funds
- Local economy
- The NIMBY factor
- Commitment to local/disadvantaged businesses

5. Contractor Issues

- Level of competition in the market
- Capability of firms to perform the work under the delivery method
- Climate for claims/record of cost growth
- Perceptions of owner ability to manage/oversee

6. Other Issues

- Stability of the project definition
- Right of way/land acquisition
- Environmental certainty
- Codes and other regulations
- Cash flow

While not exhaustive, this list must be prioritized to reflect the owner’s “hot buttons” and the project environment. The matrix should be revisited with each new project within the program to determine if another delivery method is better suited to the current scope and climate. For example, the first operating segment of a transportation system may be best suited for a Design/Bid/Build delivery method where the design standards, technology requirements, development of the owners’ organization and culture can be established. The next phase may be required to be delivered rapidly as a result of overwhelming user demand. With standards in place, the owner might choose a design-build project delivery to deploy construction quickly.

Concluding Remarks

When faced with selecting a project delivery system for a particular project, each owner should consider how much responsibility and corresponding risk they want to delegate and the level of project control and coordination their in-house staff and/or consultants are capable of providing. They should weigh the respective control, quality, budget and schedule issues, and understand the risks associated with each of the project delivery systems. In sum, there are no set rules for selecting a project delivery system, but a thorough understanding of the contracting options available can allow the owner to choose the project delivery system most appropriate to manage their risk and insure project objectives.